

EXTENT OF ADOPTION OF IMPROVED *BORO* PADDY CULTIVATION PRACTICES BY THE FARMERS

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ABSTRACT

The present study was conducted to see the extent of adoption of improved boro paddy cultivation practices by the farmers of Biswanath sub-division. Purposive cum random sampling technique was followed. A total of 120 respondents constituted the sample of the study. Ex-post-facto research design was followed. Data collection was done by adopting the personal interview technique administering a structured schedule. Frequency, percentage, mean and Standard deviation were the statistical techniques used for the analysis of data. The study revealed that majority (68.34%) of the respondents had medium level of extent of adoption, followed by 18.33 per cent of the respondents having high level of extent of adoption and only 13.33 per cent of the respondents had low level of extent of adoption of improved boro paddy cultivation practices.

KEYWORDS: *Extent of Adoption, BORO Paddy*

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INTRODUCTION

In Assam *boro* (summer rice) and early ahu (autumn rice) are grown in drier season and expansions of areas under these crops are the key to raise the productivity of rice in the state. *Boro* is the most productive season for growing rice in Assam as the sky remains clear during crop growing period and is risk-free so far as flood and drought are concerned. Farmers are encouraged to take up its cultivation in the season when irrigation facilities are available. However, the main environmental factor limiting *boro* paddy cultivation is the cold stress. Minimum temperature falls down to as low as 100 °C in the vegetative stage and 150 °C during panicle initiation stage that are detrimental for obtaining potential yield. The effect of cold is more severe in the districts of Upper Assam (Golaghat, Jorhat, Sivasagar, Dibrugarh, and Tinsukia). Therefore, *boro* paddy is traditionally not grown in these districts. Of the state's total area of 2.5 million ha under rice, *boro* paddy covers only about 0.15 million ha (Anon., 1993). Area, production and average yield of *boro* paddy in Assam during 2008-09 was 3.60 lakh ha, 7.71 lakh MT and 2,142 kg/ ha (Anon., 2008-09) and during 2012-13 was 3.93 lakh ha, 11.64 lakh MT and 2,965 kg/ha (Anon., 2014). The spread of the newer varieties replacing the older varieties need to be closely monitored to take the advantage of the superior characters these newer varieties released by various research institutions. This will help to break the yield plateau that has been experiencing in rice crop in the recent past and to increase the production and productivity of the crop. Achievement of *boro* paddy in Assam during 2014-15 was 4.16 lakh ha, 12.24 lakh MT and 2,940 kg/ha in terms of area, production and yield. In order to know the present level of adoption the study was carried out with the objective-

- To study the extent of adoption of improved *boro* paddy cultivation practices by the sample farmers.

RESEARCH METHODOLOGY

The present study was carried out in Biswanath sub-division of Sonitpur district of Assam, because the acreage of *boro* paddy cultivation under Biswanath sub-division was 1,664 hectares and the production and productivity were 7,409.80 MT and 4,453 kg/ha respectively (Anonymous, 2014-15). Hence, this situation was considered as convenient for drawing the requisite sample of respondents cultivating *boro* paddy in this sub-division. Two development blocks namely Biswanath and Baghmara development block were selected randomly. Six villages were selected from the two selected development block namely Niz-Biswanath, Kumolia, Swaguri, Rotowa, Kherbari, Behapukhuri. A total of 120 farmers were selected as respondents for the study by following proportionate random sampling technique.

The dependent variable of the study was extent of adoption on improved practices of *boro* paddy cultivation. Measurement procedure for measuring extent of adoption was followed in the light of the procedure used by Baruah (2004). Extent of adoption of selected *boro* paddy cultivation practices by the farmers has been conceived as the adoption of the recommended *boro* paddy cultivation practices against three response categories, viz., full adoption, partial adoption and non adoption. If a farmer was found to adopt a given practice as per recommendation, it was considered as 'full adoption' which was assigned a score of 2. A deviation from the recommended practice was considered as 'partial adoption' which was assigned a score of 1. Farmers who did not follow the recommended practice at all was considered as 'no adoption' and assigned a score of 0. It is interesting to know that no sample farmers adopted over adoption in the study area. The extent of adoption was calculated for 23 selected *boro* paddy cultivation practices as recommended by Assam Agricultural University and Department of Agriculture, Govt. of Assam.

The total score obtained by a respondent was calculated by adding the adoption scores for all the practices followed by that respondent. On the basis of the mean (\bar{X}) and standard deviation (S.D.) of obtained scores, the respondents was classified into three categories as follows:

Table 1

Category	Range
Low	Below ($\bar{X} - 1S.D.$)
Medium	Between ($\bar{X} - 1S.D.$) and ($\bar{X} + 1S.D.$)
High	Above ($\bar{X} + 1S.D.$)

FINDINGS

Extent of Adoption of Improved *Boro* Paddy Cultivation Practices by the Farmers

Table 1 revealed that majority (68.34%) of the respondents had medium level of extent of adoption, followed by 18.33 per cent of the respondents having high level of extent of adoption and only 13.33 per cent of the respondents had low level of extent of adoption of improved *boro* paddy cultivation practices.

Table 2: Distribution of Respondents According to Overall Extent of Adoption of Improved *Boro* Paddy Cultivation Practices (n=120)

Category	Score Range	Frequency	Percentage (%)
Low extent of adoption	< 25.59	16	13.33
Medium extent of adoption	25.59-34.38	82	68.34
High extent of adoption	>34.38	22	18.33

Table 2: Contd.,			
Total		120	100.00
Mean		29.99	
S.D		4.39	
C.V		14.63	

Practice Wise Extent of Adoption of Improved Boro Paddy Cultivation Practices

HYV Variety

Table 2 reveals that all the respondents (100.00%) fully adopted the recommended varieties. The reason of full adoption of the HYV varieties might be because of awareness about the varieties, good yield and advantageous characteristics of the varieties.

Seed Selection

Regarding recommended practice of seed selection of *boro* paddy, all the respondents (100.00%) fully adopted the practice. The reason of full adoption of this practice was due to less complexity involved in the practice, awareness about the practice, insignificant expenditure involved, also because of more or less similarity of the recommended practice with the traditional practice etc.

Nursery Bed Preparation

It is seen from the Table 2 that 42.50 per cent and 21.67 per cent of respondents fully adopted the practices like nursery bed size and quantity of seed in the field respectively. Practices like nursery bed size and quantity of seed were partially adopted by 57.50 per cent and 78.33 per cent of the respondents respectively. Majority of the respondents (77.50%) partially adopted the practice of plant protection measures in seed bed followed by 22.50 per cent of the respondents fully adopted the practice.

The majority of the respondents partially adopting the practice of nursery bed size was due to the fact that they used to adjust this practice according to their soil type and necessity. Again, the majority of the respondents partially adopting the practice of quantity of seed was due to the fact that they used to adjust this according to their seed beds prepared and also farmers were not aware of the seed germination percentage and in order to maintain the plant population. The majority of the respondents partially adopted the plant protection measures in their seed beds may be because since this practice is need based, they did not feel the necessity, also because of lack of awareness about the importance of plant protection measures in the seed beds, etc.

Sowing Time

Regarding recommended practice of sowing time of seeds of *boro* paddy, all the respondents (100.00%) fully adopted the recommended practice of sowing time of seed. The reason of the full adoption of the practice was due to awareness about the practice and availability of irrigation facilities arranged.

Interculture Operations

Data presented in Table 2 reveals that the majority of the respondents (65.84) partially adopted the practice of recommended numbers of weeding followed by 34.16 per cent of the respondents fully adopted the practice. Mechanical weeding practice was not adopted by 100.00 per cent of the respondents. The majority of the respondents (53.33%) partially adopted the practice of manual weeding followed by 46.67 per cent of the respondents fully adopted the practice.

Again, the majority of the respondents (65.84%) fully adopted the practice of time of gap filling followed by 28.33 per cent of the total respondents partially adopted the practice. On the other hand, only 5.84 per cent of the total respondents were found to be in no adoption category. The reason behind majority of the respondents partially and not adopting the recommended intercultural operations might be due to the farmers' reluctance, less or no harm to seedlings occurred in *boro* paddy and hence not felt the necessity, to minimize the cost of production, unawareness about the practice, etc.

Transplanting of Seedlings per Hill

The Table 2 reveals that the majority of the respondents (93.33%) fully adopted the practice of number of seedlings per hill; the remaining 6.67 per cent partially adopted the practice. Again, the majority of the respondents (79.16%) partially adopted the practice of transplanting time followed by 20.84 per cent of the respondents who fully adopted that practice.

The majority of the respondents fully adopting the practice of number of seedlings per hill were due to similarity to some extent of the traditional method with the recommended practice and also farmers' awareness about the practice. The reason behind the partial adoption by the respondents was due to their poor knowledge about the practice. Again, the majority of the respondents partially adopting the practice of transplanting time i.e. deviation from recommended time was due to the problem of flood, added to it was the respondents' unawareness about the flood prone area varieties and recommended practices, due to poor extension contact and mass media exposure etc.

Basal Method of Fertilizer Application

It is seen from the Table 2 that the majority of the respondents (57.50%) partially adopted the practice of recommended fertilizer followed by 42.50 per cent of the total respondents fully adopted the practice. Again, the majority of the respondents (55.84%) fully adopted urea in *boro* paddy followed by 44.16 per cent of the total respondents partially adopted urea in *boro* paddy. Among all the respondents, 53.33 per cent, 35.84 per cent, 10.84 per cent fully, partially and not adopted SSP in *boro* paddy. Regarding the application of recommended dose of MOP, majority of the respondents (46.68%) not adopted the practice followed by 29.16 per cent of the total respondents fully adopted the practice and 24.16 per cent respondents partially adopted the practice.

The majority of the respondents partially adopted the practice of recommended fertilizer was due to unawareness about the practice. Again, the majority of the respondents fully adopted urea, SSP in *boro* paddy was due to awareness about the advantages of using the practice and the respondents partially and not adopted the urea, SSP in *boro* paddy was due to the fact that they used to apply compost which was locally available and did not want to invest much in buying fertilizers. Majority of the respondents not adopting MOP in *boro* paddy was due to their perceived notion that this increased the cost of cultivation which was quite unnecessary when their soils were already fertile.

Split Application of Urea

Data presented in Table 2 reveals that the majority of the respondents (90.00%) fully adopted the practice of number of split application of urea. The remaining 5.84 per cent of the respondents did not adopt the practice at all followed by 4.16 per cent respondents partially adopted the practice. Again, the majority of the respondents (50.00%) followed fully the practice of timing followed by 43.33 per cent of the total respondents deviated from the practice and only 6.67 per cent respondents not adopted the practice. Majority of the respondents (82.50%) engaged in partial split application of urea followed by 11.67 per cent of the total respondents engaged in full application of urea. On the other

hand, 5.84 per cent of the respondents did not adopt the practice.

The reason behind the partial and no adoption of the practice of number of split urea application was due to poor training exposure, unawareness about the practice, etc. The partial and no adoption of the practice of time of application were due to untimely supply of inputs, unawareness and lack of knowledge about the practice. Majority of the respondents partially and some of the respondents not adopted urea for split application in *boro* paddy was due to the fact that unawareness about the practice, poor extension contact, etc.

Plant Protection Measures

The Table 2 reveals that the majority of the respondents (80.00%) fully adopted the recommended chemical followed by 20.00 per cent of the total respondents not adopting the practice in case of pest. Again, in case of pest the majority of the respondents (50.00%) did not adopt the practice of quantity of chemical applied followed by 30.84 per cent, 19.16 per cent of the total respondents partially and fully adopted the practice of quantity of chemical applied, respectively.

In case of disease, majority of the respondents (80.84%) did not adopt the recommended chemical followed by 19.16 per cent of the total respondents fully adopted the practice. Again, majority of the respondents (80.84%) did not adopt the recommended quantity of chemical. About 14.16 per cent and 5.00 per cent of the total respondents fully and partially adopted the practice, respectively.

In case of pest, majority of the respondents fully adopted the recommended chemical and it because of awareness about the recommended chemical and the respondents did not adopt the practice was due to unawareness, lack of knowledge about the practice. Majority of the respondents partially and some of the respondents not adopted the recommended quantity of chemical was due to the respondents' unfelt needs about the plant protection measures, no adoption might be a way to decrease the cost of cultivation and unawareness about the practice, poor extension contact and mass media exposure etc.

In case of disease, majority of the respondents did not adopt the recommended chemical; it was due to unawareness and lack of knowledge about the recommended chemical and the respondents fully adopted the practice may be due to awareness about the practice. Majority of the respondents not adopted and some of the respondents partially adopted the recommended quantity of chemical was due to the respondents' unfelt needs about the plant protection measures, no adoption might be a way to decrease the cost of cultivation, believed that plant protection chemicals were harmful rather than beneficial, unawareness and lack of adequate knowledge about the practice, etc.

Table 3: Distribution of Respondents According to Practice Wise Extent of Adoption of Improved Boro Paddy Cultivation Practices (n=120)

Sl. No.	Practices	Full Adoption Frequency (%)	Partial Adoption Frequency (%)	No Adoption Frequency (%)
1.	HYV variety	120(100.00)	0	0
2.	Seed selection	120(100.00)	0	0
3.	Nursery bed preparation			
I.	Nursery bed size	51 (42.50)	69 (57.50)	0
II.	Quantity of seed	26 (21.67)	94 (78.33)	0
III.	Plant protection measures in seed bed	27 (22.50)	93 (77.50)	0
4.	Sowing time	120 (100.00)	0	0
5.	Interculture operations			
I.	Numbers of weeding	41 (34.16)	79 (65.84)	0
II.	Mechanical weeding	0	0	120(100.00)

Table 3: Contd.,				
III.	Manual weeding	56 (46.67)	64 (53.33)	0
IV.	Time of gap filling	79 (65.84)	34 (28.33)	7 (5.84)
6.	Transplanting of seedlings per hill			
I.	No. of seedlings per hill	112 (93.33)	8 (6.67)	0
II.	Transplanting time	25 (20.84)	95 (79.16)	0
7.	Basal method of fertilizer application			
I.	Fertilizer used	51 (42.50)	69 (57.50)	0
II.	Dose			
i.	Urea	67 (55.84)	53 (44.16)	0
ii.	SSP	64 (53.33)	43 (35.84)	13 (10.84)
iii.	MOP	35 (29.16)	29 (24.16)	56 (46.68)
8.	Split application of urea			
I.	No. of split application of urea	108 (90.00)	5 (4.16)	7 (5.84)
II.	Time of application	60 (50.00)	52 (43.33)	8 (6.67)
III.	Dose	14 (11.67)	99 (82.50)	7 (5.84)
9.	Plant protection measures			
I.	Pest			
i.	Chemical used	96 (80.00)	0	24 (20.00)
ii.	Quantity applied	23 (19.16)	37 (30.84)	60 (50.00)
II.	Disease			
i.	Chemical used	23 (19.16)	0	97 (80.84)
ii.	Quantity applied	17 (14.16)	6 (5.00)	97 (80.84)

CONCLUSIONS

Since there is a great potentiality in *boro* paddy cultivation in terms of situational feasibility and economic viability in Assam where vast majority farmers were small and marginal, adoption of improved practices of *boro* paddy would certainly improve their socio-economic condition, with minimum risks and uncertainties in cultivation. This calls for conscious consideration and care on the part of extension workers and other concerned institutions on adoption and proper management of *boro* paddy cultivation. The findings on extent of adoption revealed that the majority of the farmers had medium level of adoption of recommended cultivation practices. The extension agencies should continue their efforts in accelerating the adoption of recommended cultivation practices of *boro* paddy.

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